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10/769,502	01/31/2004	Liqing Hu	USP2292C/SH23-HLQ	8382
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RAYMOND Y. CHAN				
108 N. YNEZ AVE., SUITE 128				
MONTEREY PARK, CA 91754				
EXAMINER				
ONEILL, KARIE AMBER				
ART UNIT		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/769,502

Applicant(s)

HU ET AL.

Examiner

Karie O'Neill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4, 8, 9 and 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-7, 10-13, 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's election without traverse of Species A (a pair of end plates pulled towards each other by a long insulated bolt for the attaching means) and Species B (the main passages are through passages for the main passages), Claims 1,2, 5-7, 10-13 and 17-19, in the reply filed on April 5, 2007, is acknowledged.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In Claim 5, a sealing plate is disclosed, however, in Claim 6 line 2, which depends on Claim 5, a sealing ring is disclosed. It is unclear to the examiner if the invention relates to a sealing plate or a sealing ring.

4. Claims 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the examiner what is meant by "detachably sealed".

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 5-7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Gorbett et al. (US 5,486,430).

With regard to Claim 1, Gorbett et al. disclose an integral multi-stack system of fuel cells, comprising: at least one pair of fuel cell stacks each having a stack unit combined by a predetermined number of single fuel cells, as seen in Figures 10 and 11 where the fuel cells stacks are in a two tiered array of fuel cell stacks (302, 304), a first bus plate (108a) and a second bus plate (108b) respectively placed at each end of the fuel cell stack dissecting the cross-section of the fuel cell stack, the bus plates would include openings for gases and liquids to pass through the cell (see Figure 2), and a plurality of ports, including a fuel inlet (132), an oxidant inlet (136), a coolant inlet (140), a fuel outlet (134), an oxidant outlet (138), and a coolant outlet (142), which are used for supplying fuel, supplying oxidant, supplying coolant, exhausted fuel discharging, exhausted oxidant discharging and coolant discharging for said stack respectively; in Figures 2, 4 and 8-9 and column 5 lines 1-15, a manifolding functional frame, also called a fluid manifold end plate (114), comprising a solid non-porous body (column 6 lines 4-29) having a plurality of main passages including a main fuel supply passage (232), a main oxidant supply passage (236), a main coolant supply passage (240), a

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main fuel discharging passage (234), a main oxidant discharging passage (238), and a main coolant discharging passage (242) provided therein without communicating with each other, the main body having more than one set of sub-passages or branches, wherein each of said sub-passages is provided for engaging with one said fuel cell stack and each of said sub-passages includes a fuel supply sub-passage (232a), a oxidant supply sub-passage (236a), a coolant supply sub-passage (240a), a fuel discharging sub-passage (234a), a oxidant discharging sub-passage (238a), and a coolant discharging sub-passage (242a), without communicating with one another, to said fuel inlet, said oxidant inlet, said coolant inlet, said fuel outlet, said oxidant outlet, and said coolant outlet of said fuel cell stack respectively (column 5 lines 24-37); and an attaching means, which can be any of compression bars (116a, 116b), tie rods (118a, 118b), fastening nuts (120a, 120b) and compression end plate (122), for firmly attaching said fuel cell stack to said body of said manifold functional frame or fluid manifold endplate (114), wherein when each said fuel cell stack is securely attached to said body of said manifold functional frame (114), said fuel inlet, said oxidant inlet, said coolant inlet, said fuel outlet, said oxidant outlet and said coolant outlet of said fuel cell stack are capable of air-communicating with fuel supply sub-passage, oxidant supply sub-passage, coolant supply sub-passage, fuel discharging sub-passage, oxidant discharging sub-passage and coolant discharging sub-passage of said manifold functional frame so as to make said main passages and said sub-passages to be used to selectively supply and discharge gas or liquid used by said fuel cell stacks integrated (column 5 lines 6-37).

With regard to Claims 2 and 7, Gorbett et al. disclose wherein said attaching means comprises a pair of end plates (122) and compression bars (116) being pulled toward each other by a plurality of long bolts or tie rods (118a, 118b) passing through a plurality of corresponding screw holes and fastened with fastening nuts (120a, 120b) formed in said manifold functional frame (114) so as to sandwich said pair of fuel cell stacks therebetween. In Figures 10 and 11, a two-tiered array (302, 304) of fuel cell stacks are mounted on a base (306) and the tongue-and-groove arrangement maintains the alignment and structural stability of the fuel cell stack arrays (column 5 lines 38-47).

With regard to Claim 5, Gorbett et al. disclose, in Figure 2, wherein said integral multi-stack fuel cell system further has a sealing plate or sealing gasket (121) for fluid tightly connecting each said fuel cell stack to manifold functional frame (114) and preventing the fluid streams which flow in and out of the passages from communicating with the environment surrounding the stack (column 4 lines 55-64).

With regard to Claim 6, Gorbett et al. disclose in Figure 2, a sealing gasket (121) having a plurality of openings including a first fuel opening, a first oxidant opening, a first coolant opening located in the sealing gasket of the first tier (302) of the two-tiered array, and second fuel inlet, a second oxidant outlet and a second coolant inlet located in the sealing gasket of the second tier (304) of the two-tiered array, which are able to align in a parallel or tongue-and-groove manner with said fuel inlet, said oxidant inlet, said coolant inlet, said fuel outlet, said oxidant outlet and said coolant outlet of said first bus plate (108a) when said fuel cell stack is placed thereon, and a rubber sealing ring

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attached on each surface of the sealing gasket surrounding each said opening thereof (column 5 lines 61-63).

With regard to Claim 10, Gorbett et al. disclose wherein said fuel is hydrogen and said oxidant is oxygen containing air or substantially pure oxygen (column 1 lines 31-33).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 11-13 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorbett et al. (US 5,486,430), as applied to Claims 1, 2, 5-7, and 10, and in further view of Wilkinson et al. (US 5,773,160).

Gorbett et al. disclose the integral multi-stack system of fuel cells in paragraph 6 above, but do not disclose wherein a passage fitting is provided for each said main passage to facilitate an access thereof to peripheral equipment. Gorbett et al. also do not disclose wherein said main passages are through passages through said body of said manifold functional frame with one end detachably sealed.

With regard to Claims 10-13, Wilkinson et al. disclose in Figure 1, a fluid end plate (44) with six extending inlet and outlet ports (62, 64, 66, 68, 70, 72) for connecting the incoming and outgoing reactant and coolant streams to the stack (column 10 lines

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32-38). The extending ports act as fittings for the manifold plate. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use fittings with the manifold main passages of Gorbett et al., because Wilkinson et al. teach that the ports allow for introduction of pressurized fluid and gas through the connection of peripheral equipment to the ports or fittings (column 11 lines 23-27).

With regard to Claims 17-19, Wilkinson et al. disclose a fluid end plate containing ports for connecting peripheral equipment to the extending ports and allow for the introduction of gas and fluid into the fuel cell system through the fluid end plate (44). The fluid end plate contains through passages, which enable the delivery of gases to the fuel cell stack and allow for the removal of gases and fluid from the fuel cell stack. Therefore, at the time of the invention it would have been obvious to use a manifold end plate that is able to connect to peripheral equipment and can be detachably sealed because when disconnecting the fuel cell manifold from peripheral equipment, such as fuel supply, oxidant supply and/or coolant supply, a seal would necessarily be present in order to close off the fuel cell system in order maintain the desired pressure and temperature of the fuel cell.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MARK RUTHKOSKY  
PRIMARY EXAMINER  
*Mark Ruthkosky*  
6.21.07

Karie O'Neill  
Examiner  
Art Unit 1745

KAO